Beef Slaughter Plant Application

Carcass after removal of hide

Post skinning wash

Inhibitor or Microbial Blocking Agent (*carrageenan or CMC or dextran sulfate*) dispensed in a spray box

Evisceration

Splitting

Final wash
(water spray)
Removal of bacterial contamination with arginine and Tween 80/NaCl or phosphate buffer with Tween/NaCl

Chill

Fabrication

Trimmings; Primals

Inhibitor or Microbial Blocking Agent (carrageenan or CMC or dextran sulfate) dispensed as spray or immersion
(Anti-bacterial compound may also be incorporated)

Packaging

Distribution, retailing

FIG. 1

Poultry (Chicken) Slaughter Plant Application

Kill Room

Scalding/defeathering

Evisceration

Chlorination
(high pressure chlorinated water jets thoroughly clean the entire bird)

Inspection
(for fecal contamination before chilling)

Chilling
(The birds body temp is about 98° F and must be lowered to 40 ° F or below before processing. Birds are sent to soak in the chiller for 73 minutes. Each chiller holds 20,000 gals. of chlorinated water.)

Inhibitor or Microbial Blocking Agent (carrageenan or CMC or dextran sulfate) dispensed in a spray box

Grading
Birds are rehung in shackles to be graded.

Packaging of Whole Birds
or
Cut-up

2nd Inhibitor or MBA (carrageenan or CMC or dextran sulfate) application to cut-ups
(anti-bacterial agent such as Cetyl Pyridium Chloride may be added)
[MBA= Microbial Blocking Agent; CMC= carboxy methyl cellulose]

Boning and trimming

Packaging of cut-up parts

FIG. 2

Swine Slaughter Plant Application in Clean Room

Shaving

Carcass Washing

Head Removal, Brisket sawing, Debunging

Carcass Opening

Evisceration

Carcass Splitting

Trimming

Stamping

Final Carcass Washing
(spraying with room temp. water)

Inhibitor or Microbial Blocking Agent (carrageenan or CMC or dextran sulfate) dispensed in a spray box
(also prevents dehydration)

Chilling
(dry air blast at 2 degrees, overnight)

Cutting

Inhibitor or MBA (carrageenan or CMCor dextran sulfate) application
(anti-bacterial agent such as Cetyl Pyridium Chloride may be added)
[MBA= Microbial Blocking Agent; CMC= carboxy methyl cellulose]

Packaging or Processing

FIG. 3

Detachment for Sampling
[Laboratory Analysis]

Coat tissues with Inhibitor or Microbial Blocking Agent
(Carragenan, CMC or dextran sulfate)

Detach bacteria
Guanidine-HCl, pH 4.8
or
Phosphate buffer-NaCl-Tween 80

Enrich bacterial growth

Analyze bacteria using

1. Traditional Plate Method
or
2. Isolate target bacteria
immunomagnetic beads
or
imuno-affinity silica gel
or
3. Biosensor screening (BIAcore, etc.)
or
4. Other microbial screening and testing methods

FIG. 4

Detachment for *In Situ* Sampling in Slaughter Plants

Spray a 300 cm area with Carrageenans, or Carboxy methyl Cellulose or dextran sulfate

Spray same area with arginine to loosen the bound bacteria

Soak sponge with 0. 05% Tween 80 (Span 80) and 1% NaCl or phosphate buffer with NaCl and Tween 80

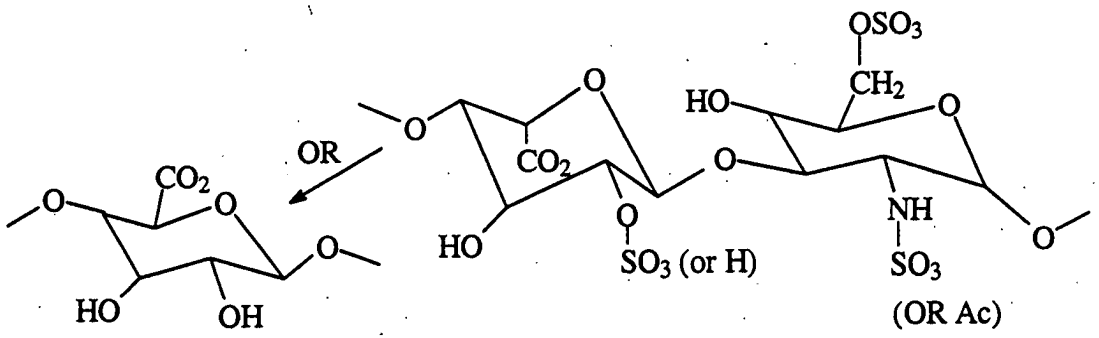
Wipe off bacteria from treated surface with pre-soaked sponge
or
with filter paper (e.g. cellulose or polycarbonate membranes)
or
with vacuum (with filter) to remove bacteria from carcass surface
remove vacuum filter for entrapped bacteria

Enrich or Extract bacteria from sponge or filter or membranes

Analyze bacteria with
1. Traditional Plate Methods
or
2. Isolate target bacteria with immunomagnetic beads
or
3. Biosensor screening (BIAcore, etc.)
or
4. Other microbial screening and testing methods

FIG. 5

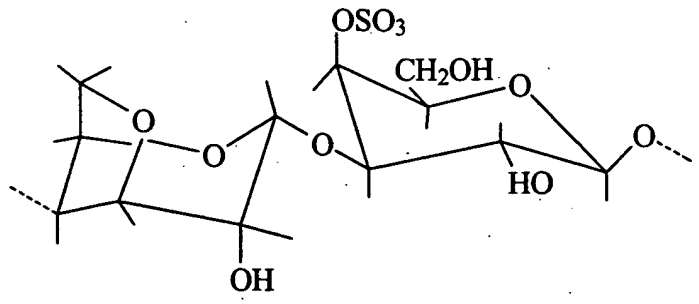
Heparan Sulfate



-[glucuronate-β 1,4...]- -[iduronate-2 sulfate-α1,4 N-sulfate glucosamine-6-sulfate α 1,4]-

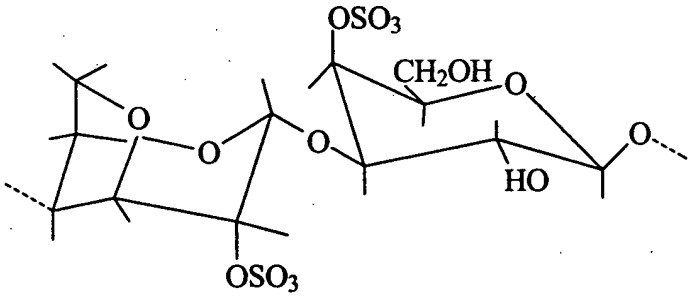
FIG. 6A

Kappa Carrageenan



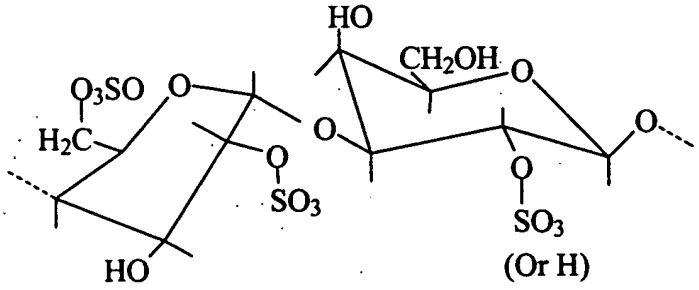
3,6-anhydro-D-galactose D-galactose-4-sulphate

Iota Carrageenan



3,6-anhydro-D-galactose-2-Sulphate D-galactose-4-sulphate

Lambda Carrageenan



D-galactose-2,6-disulphate D-galactose-2-sulphate

FIG. 6B

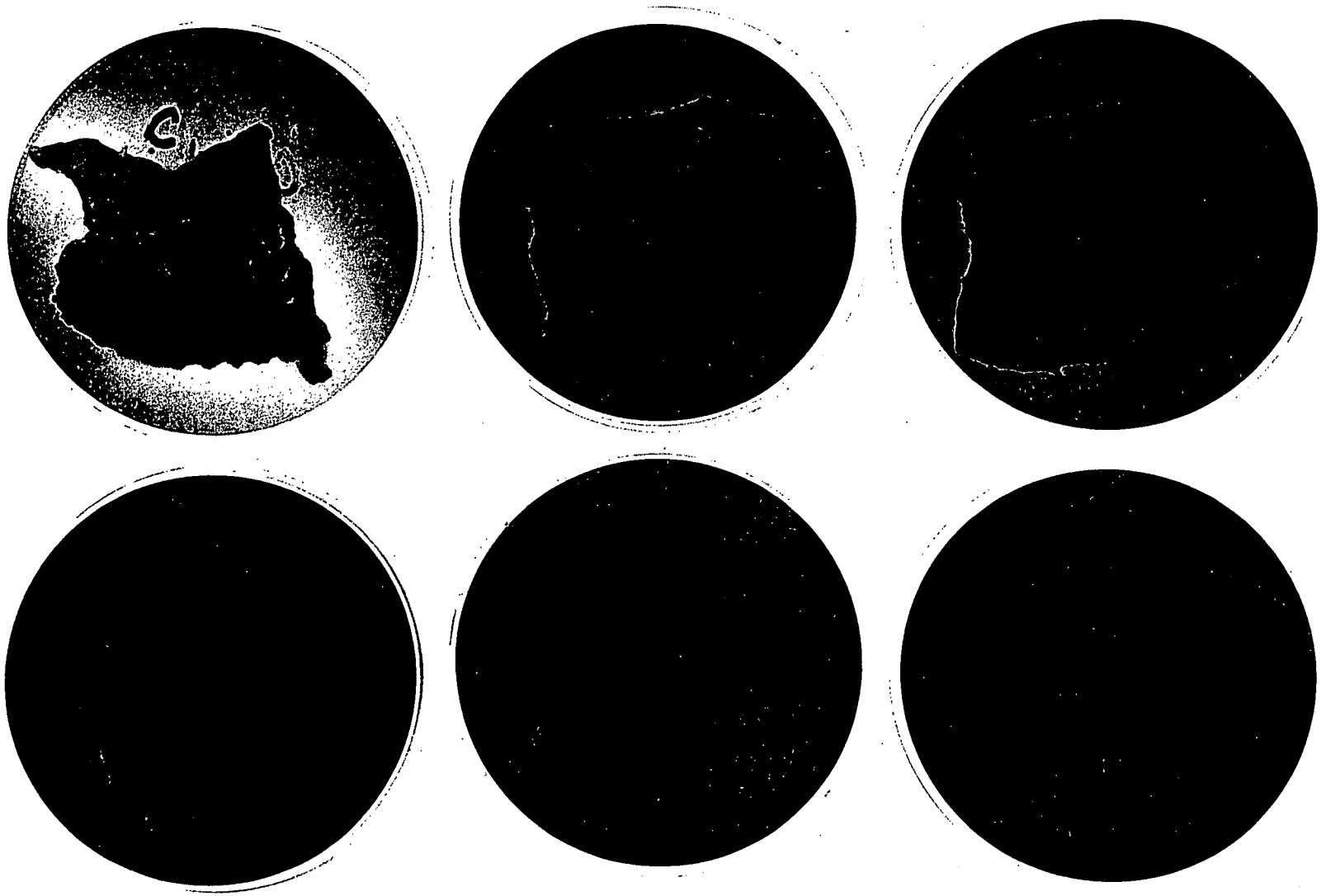


FIG. 7A

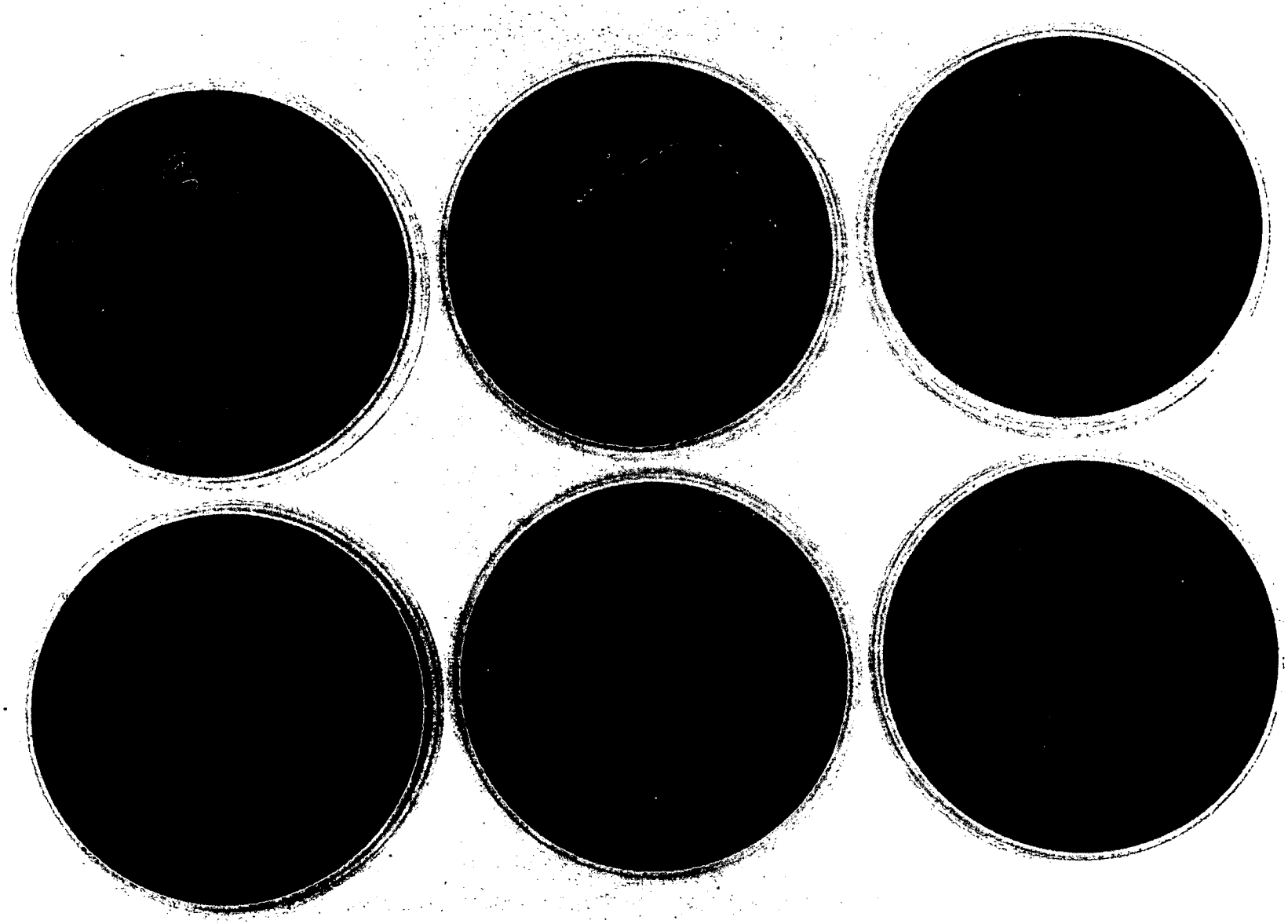


FIG. 7B

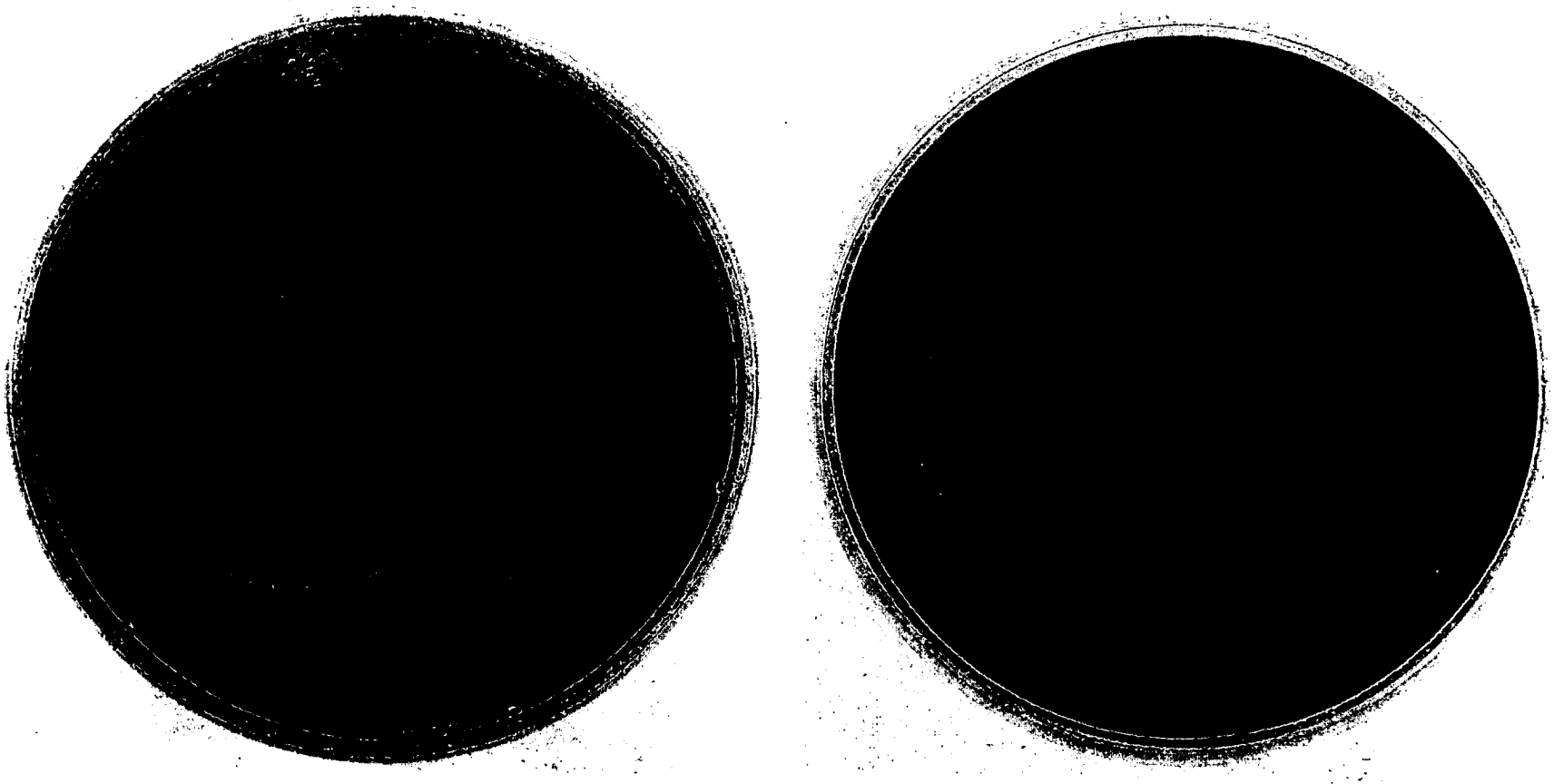


FIG. 8A

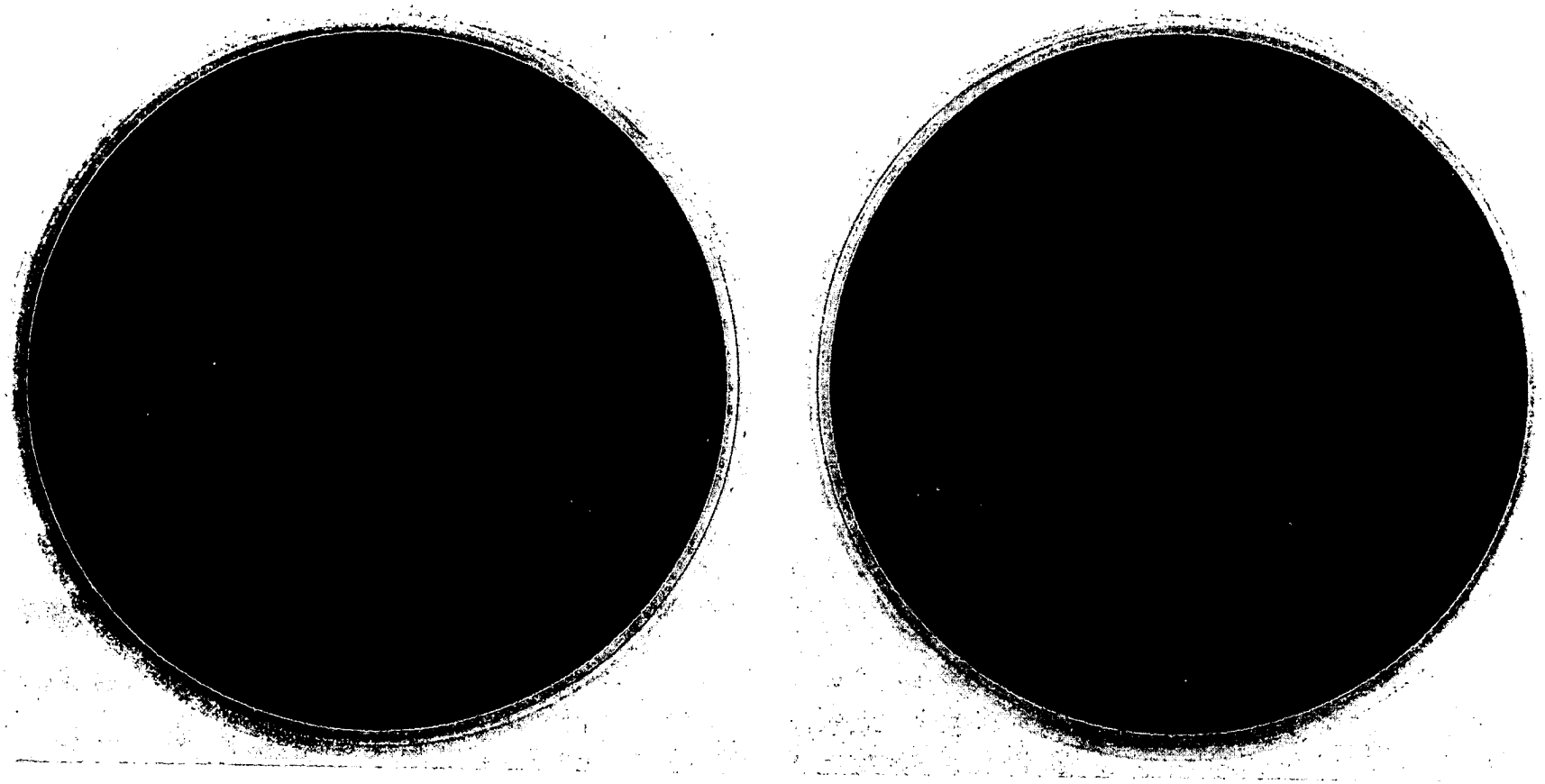


FIG. 8B

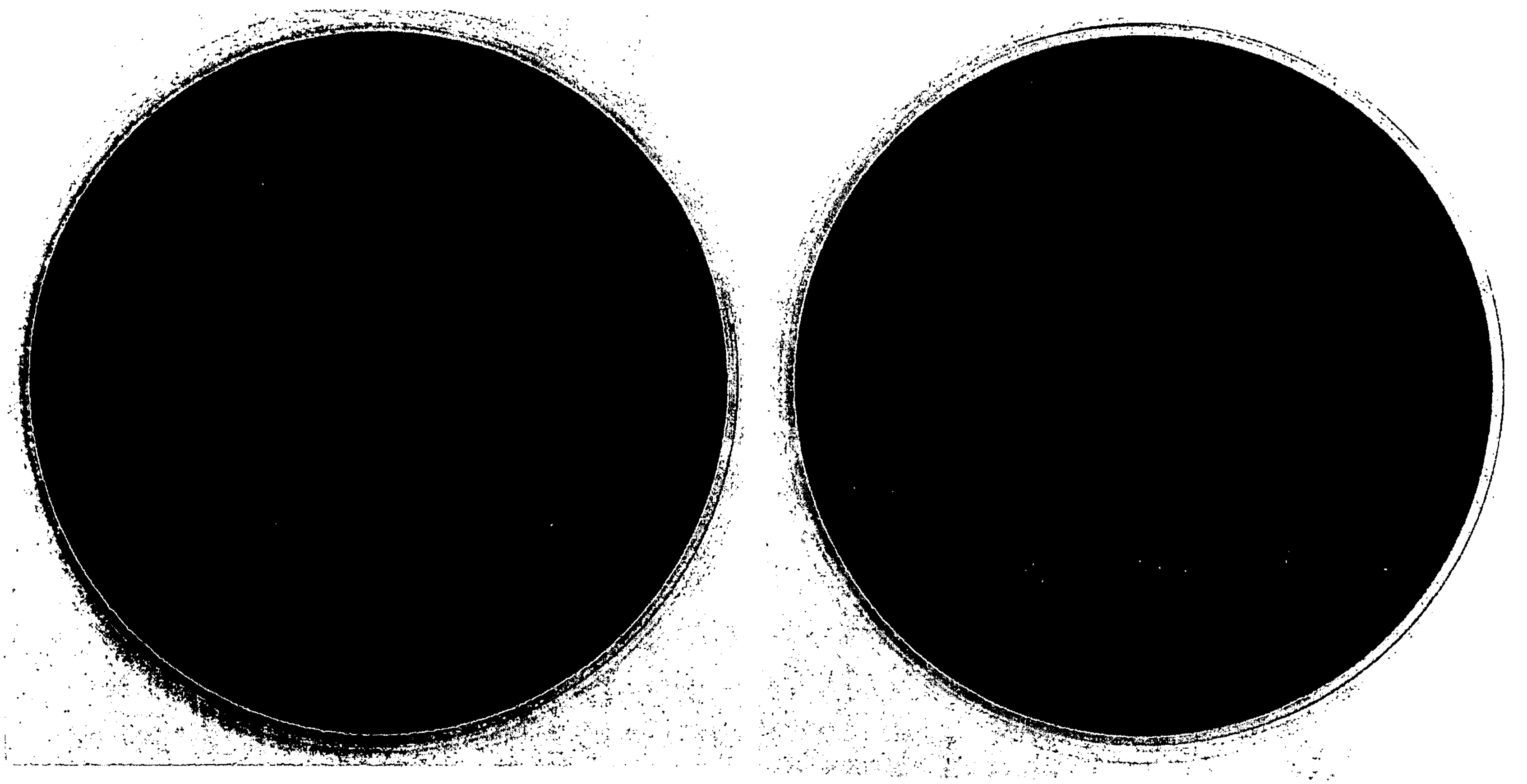


FIG. 8C

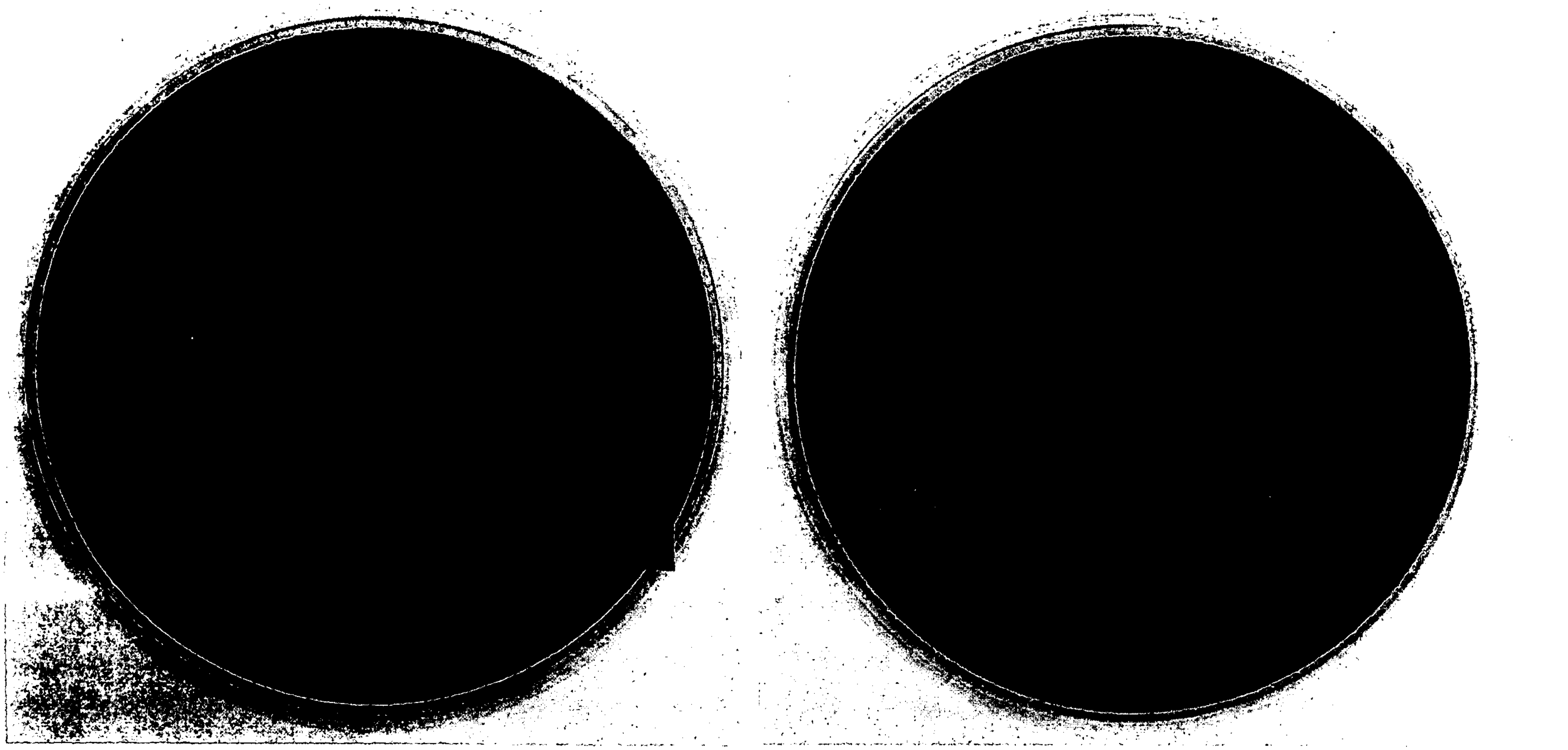


FIG. 8D

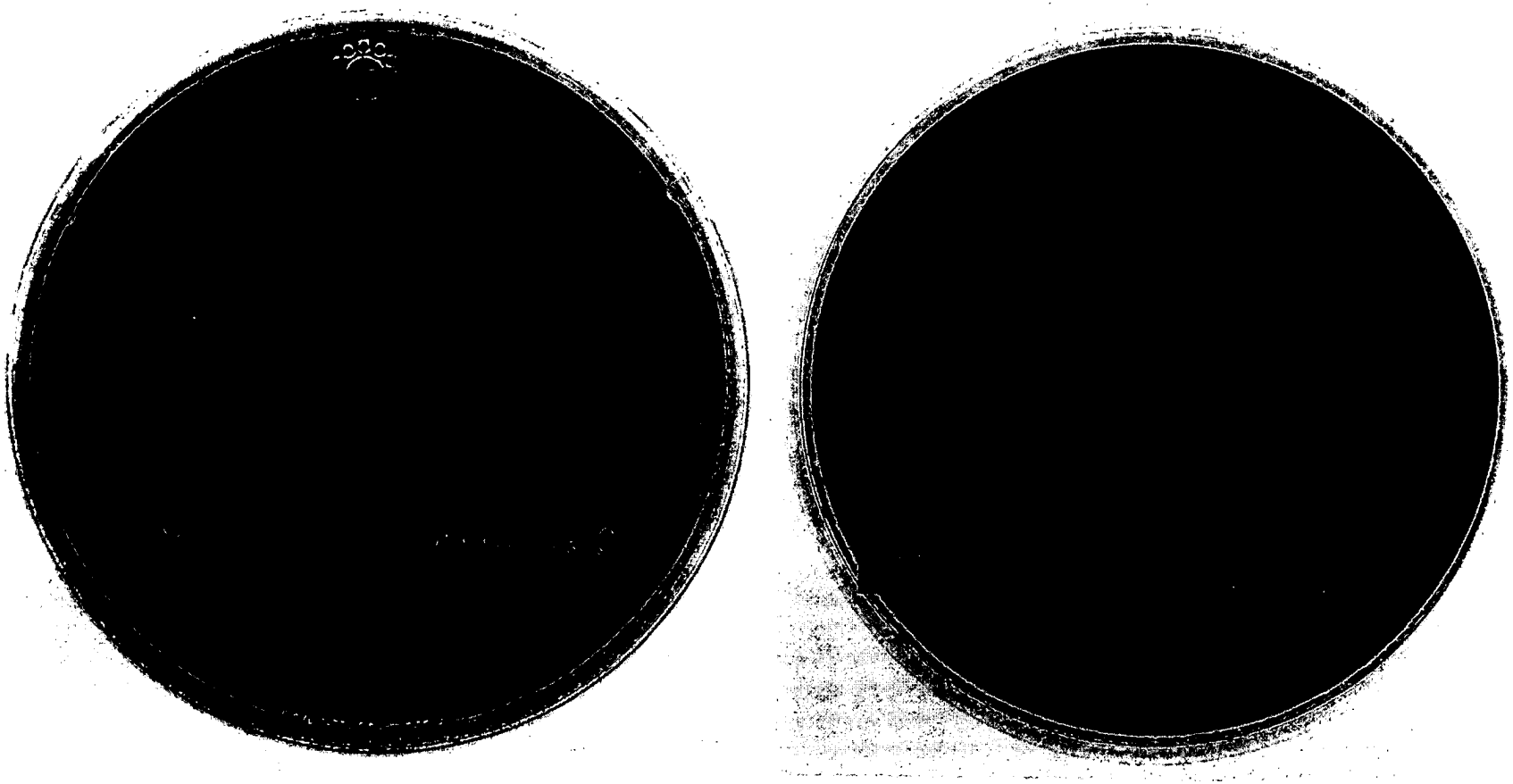


FIG. 8E

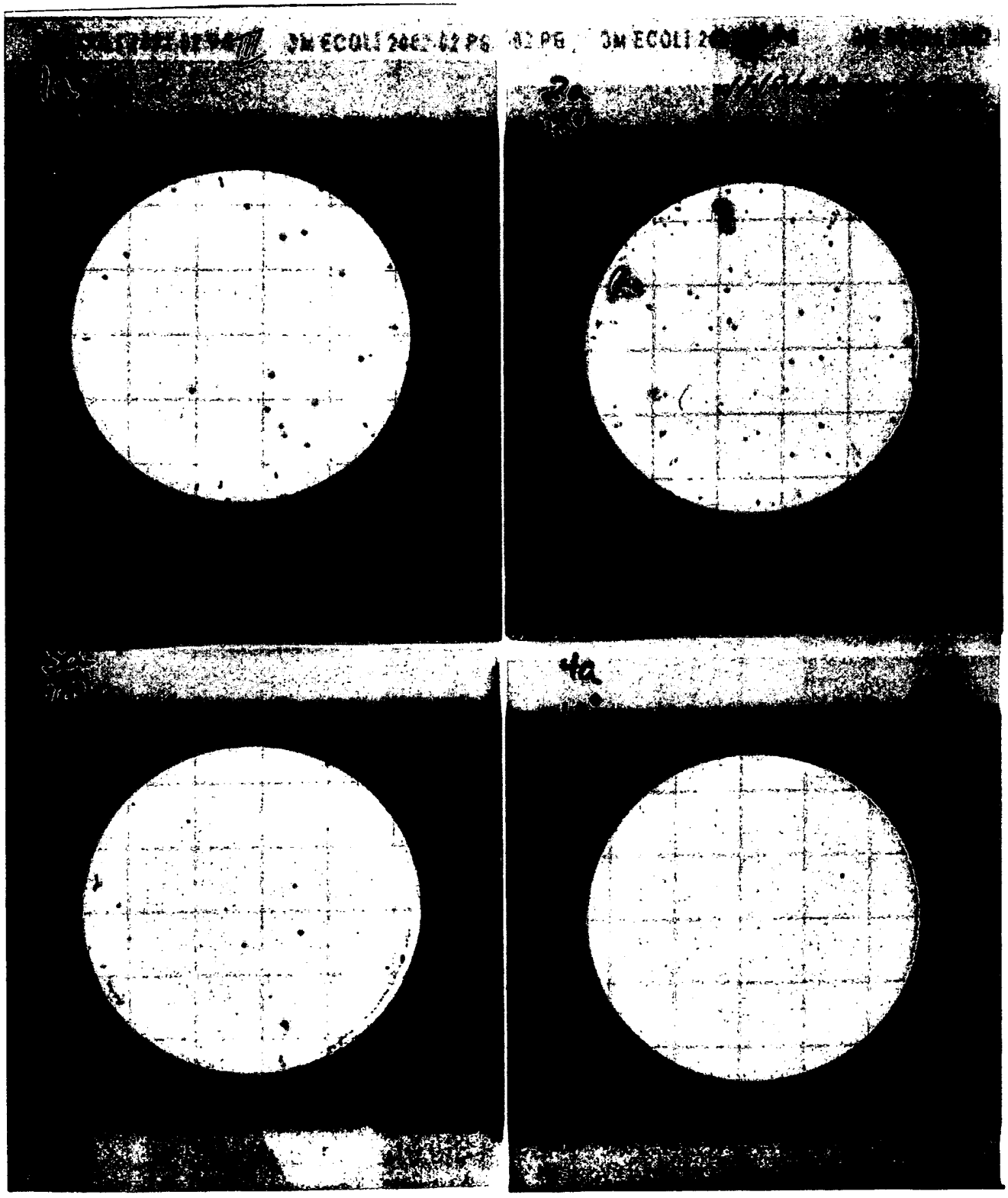


FIG. 9A

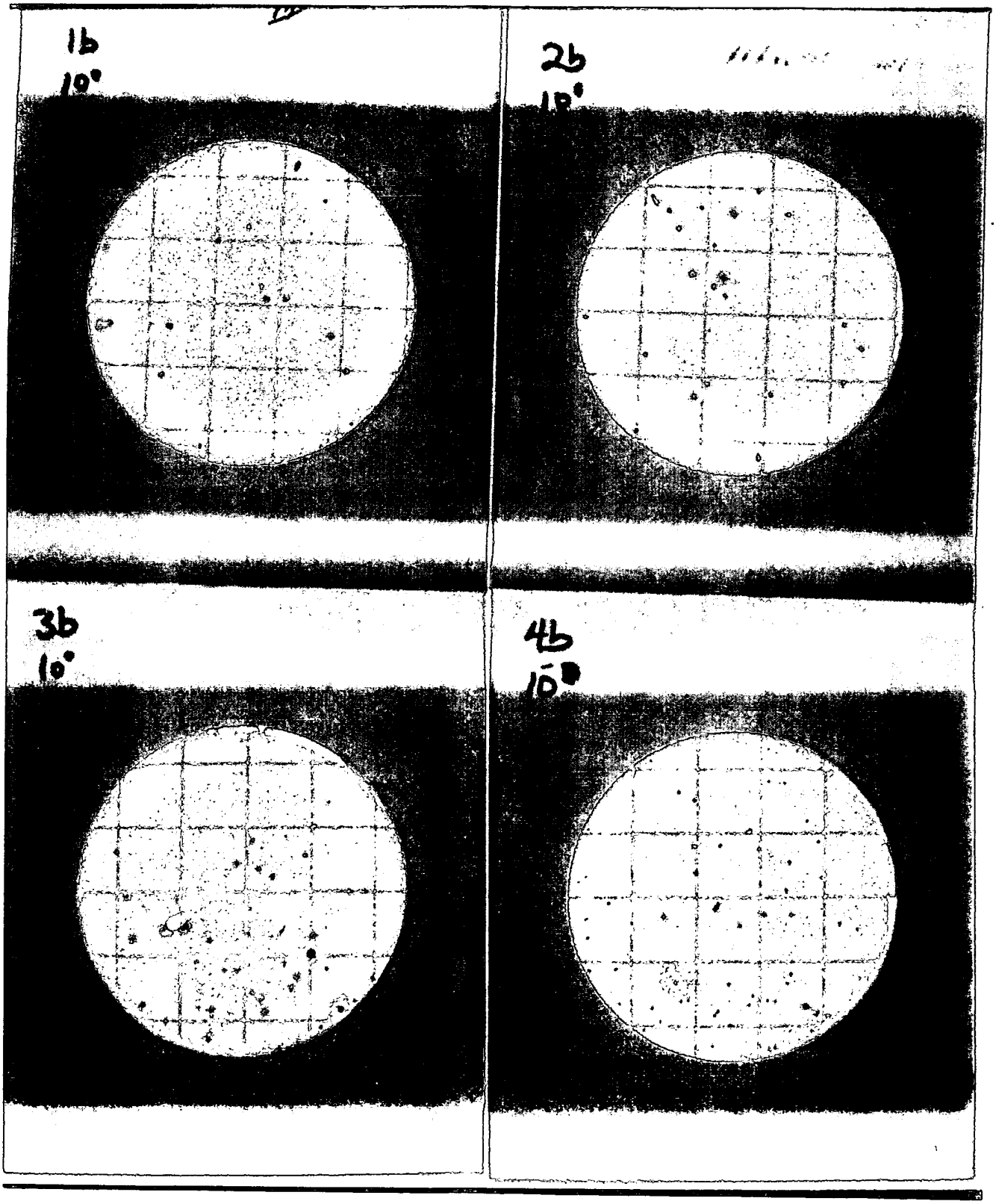


FIG. 9B